IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: Fouarge	§	Atty. Dkt. No.: F-858
Serial No.: 10/528,713	§	Group Art Unit: 1796
Confirmation No.: 8448	§	Cust. No.: 25264
Filed: August 11, 2005	§	Examiner: Cheung
For: Slurry Loop Polyolefin Reactor	§	

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Commissioner for Patents
P.O. Box 1450
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TRANSMITTAL LETTER AND FEE AUTHORIZATION

In connection with the above identified application, Applicants respectfully submit the following documents:

1. Appeal Brief.

The Commissioner is authorized to charge the fee of $540.00, along with any additional fees that may be required for this submission, or credit any overpayments, to Deposit Account No. 03-3345.

Respectfully submitted,

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APPEAL BRIEF

Appellants submit this Appeal Brief to the Board of Patent Appeals and Interferences on appeal from the decision of the Examiner of Group Art Unit 1796 dated July 24, 2008, finally rejecting claims 17-30, 34-36 and 38.

Real Party in Interest

The present application has been assigned to TOTAL Petrochemicals Research Feluy, Zone Industrielle C, Seneffe, Belgium B7181.

Related Appeals and Interferences

Appellants assert that no other appeals, interferences or judicial proceedings are known to the Appellants, the Appellants' legal representative or Assignee that will

directly affect, be directly affected by or have a bearing on the Board's decision in the pending appeal.

Status of Claims

Claims 1-15 were originally presented in the application. Claim 1-15 were cancelled and claims 16-35 were added in a Preliminary Amendment. Claims 36-37 were added in Response to the Office Action dated October 12, 2006. Claims 16 and 37 were cancelled in Response to the Office Action dated April 5, 2007. Claims 31-33 were cancelled and claim 38 was added in Response to the Office Action dated December 5, 2007. Accordingly, claims 17-30, 34-36 and 38 are pending in the application. Claim 38 stands rejected under 35 U.S.C. §112, first paragraph. Claims 17-30, 34-36 and 38 stand rejected under 35 U.S.C. §103(a). All rejections of the pending claims are appealed. The pending claims are shown in the attached Appendix A.

Status of Amendments

No amendments have been made to the pending claims in Response to the Final Office Action.

Summary of Claimed Subject Matter

Independent claim 36 recites a method of forming polyolefins comprising supplying ethylene monomer in a carrier liquid to a reactor system comprising at least one loop reactor, circulating the ethylene through the loop reactor in the presence of a catalyst system to form a slurry of polymer fluff particles in the carrier liquid, altering the flow of at least a portion of the slurry by at least one of flowing a portion of the slurry through a bypass line extending from one location of the loop reactor to another location of the same loop reactor, operating a circulating pump and circulating the slurry through the loop reactor at an efficiency of from 30-75% of a pump capacity or providing a plurality of obstacles in a flow path of the slurry within the loop reactor and while continuing the introduction of the carrier liquid and ethylene monomer into the loop reactor, withdrawing a portion of the slurry from the loop reactor as a polymer product. *See*, specification, at least Figures and paragraph 17.

Independent claim 38 recites a method of forming polyolefins comprising supplying ethylene monomer in a carrier liquid to a reactor system comprising at least one loop reactor, circulating the ethylene through the loop reactor in the presence of a catalyst system to form a slurry of polymer fluff particles in the carrier liquid, altering the flow of at least a portion of the slurry by flowing a portion of the slurry through a bypass line extending from one location of the loop reactor to another location of the loop reactor, wherein the flow circulates through the bypass line without the aid of a pump disposed within the bypass line and while continuing the introduction of the carrier liquid and ethylene monomer into the loop reactor, withdrawing a portion of the slurry from the loop reactor as a polymer product. *See*, specification, at least Figures and paragraph 17.

Grounds of Rejection to be Reviewed on Appeal

1. The rejection of claim 38 under 35 U.S.C. §112, first paragraph.

2. The rejection of claims 17-30, 34-36 and 38 under 35 U.S.C. §103(a) as being unpatentable over U.S. Pat. No. 3,595,846 *(Rouzier)*.

3. The rejection of claims 29-30 under 35 U.S.C. §103(a) as being unpatentable over *Rouzier* in view of U.S. Pat. No. 3,093,482 (*Weinreich*).

Arguments

I. THE EXAMINER ERRED IN REJECTING CLAIM 38 UNDER 35 U.S.C. §112, FIRST PARAGRAPH.

The Examiner argues that "applicants' original disclosure does not have any basis for the negative limitation 'without the aid of a pump disposed within the bypass line' as claimed in claim 38". *See*, Final Office Action at page 2, last paragraph to page 3, first paragraph. While Appellants understand that "any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph", as maintained by the Examiner, Appellants respectfully submit that support for the recitation wherein the flow circulates through the bypass line without the aid of a pump disposed within the bypass line is clearly supported by the specification. *See*, specification, at least Figures. Therefore, reversal of the rejection is respectfully requested.

II. THE EXAMINER ERRED IN REJECTING CLAIMS 17-30, 34-36 AND 38 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER *ROUZIER*.

The pending claims require a number of features that are not taught by *Rouzier*. First, *Rouzier* does not teach, show or suggest at least one loop reactor, as required by the pending claims. Rather, *Rouzier* teaches a liquid stage tubular reactor having a discrete point of origin and terminal point, wherein the reaction medium passes through the tubular reactor a single time before withdrawal. *See*, column 3, lines 35-67 and Figures. In contrast, ones skilled in the art are aware that loop reactors include continuously circulating polymer slurry through the reactor (*i.e.*, the reaction medium passes through **each** point of the reactor multiple times prior to withdrawal). *See*, at least Background and Figures. The Examiner has cited no specific support in *Rouzier* for the teaching of a loop reactor, as claimed and described in the instant specification.

Second, *Rouzier* does not teach, show or suggest forming a slurry of polymer fluff particles in the carrier liquid, as required by the pending claims. Rather, *Rouzier* broadly teaches polymerization in bulk, in solution, in suspension and in emulsion and specifically, teaches solution polymerization. *See*, column 3, lines 25-45. The support identified by the Examiner does not specifically teach, show or suggest slurry polymerization, as required by the pending claims. The Examiner argues that *Rouzier* "clearly disclose polymerization and copolymerization of olefins and diolefins that are typically polymerized in the presence of a solvent to form slurry of polymers". *See*, Final Office Action at page 15, third paragraph. Appellants respectfully submit that the present claims (and the formation of slurries) do not utilize solvents, but rather carrier liquids (*e.g.*, diluents) and accordingly, while *Rouzier* may clearly disclose polymerization in the presence of a solvent, *Rouzier* does not clearly disclose (and nowhere even discusses) the formation of a slurry, as required by the pending claims.

Further, *Rouzier* does not teach, show or suggest altering the flow of at least a portion of the slurry by flowing a portion of the slurry through a bypass line extending from one location of the loop reactor to another location of the loop reactor, wherein the flow circulates through the bypass line without the aid of a pump disposed within the

bypass line, as recited by claim 38. Rather, *Rouzier* teaches recycling part of the reaction medium by means of a pump 42. *See*, column 7, lines 1-5.

For the reasons set forth above, Appellants respectfully request reversal of the rejection.

III. THE EXAMINER ERRED IN REJECTING CLAIMS 29-30 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER *ROUZIER* IN VIEW OF *WEINREICH*.

Appellants distinguished *Rouzier* from the pending claims in the above discussion and feel that repeating such arguments is unnecessary. The prior art made of record is noted. However, it is believed that the secondary references do not supply the features missing from *Rouzier*. Therefore, it is believed that a detailed discussion of the secondary references is not deemed necessary. For the reasons set forth above, Appellants respectfully request reversal of the rejection.

Conclusion

In conclusion, *Rouzier* nowhere teaches, shows or suggests a loop reactor for slurry polymerization having the claimed features. Thus, Appellants respectfully request reversal of the rejections of claims 17-30, 34-36 and 38.

Respectfully submitted,

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Appendix A

Pending Claims

17. The process of claim 36, wherein said slurry is diverted by flowing a portion of said slurry through a bypass line extending from one location of said reactor to a second location of said reactor.

18. The process of claim 17 wherein said bypass line carries a fraction of the slurry within the range of 0.5-50% of the total flow through said loop reactor.

19. The process of claim 17 wherein said bypass line carries a fraction of the slurry within the range of 1-15% of the total flow through said loop reactor.

20. The process of claim 17 wherein the slurry in the bypass line is reintroduced into said loop reactor at an angle within the range of 1-90°.

21. The process of claim 20 wherein the slurry in said bypass line is introduced into said loop reactor at an angle within the range of 30-60°.

22. The process of claim 20 wherein the slurry in said bypass line is introduced into said loop reactor at an angle of about 45°.

23. The process of claim 17 wherein said bypass line has an average diameter, DB, and said loop reactor has an average diameter, DL, and the ratio of DB/DL is within the range of 1:12 to 1:2.

24. The process of claim 23 wherein the ratio of DB/DL is within the range of 1:6 to 1:3.

25. The process of claim 36, wherein said slurry is circulated through said loop reactor by an impeller pump having a plurality of blades and said slurry is diverted by

recirculating a portion of the slurry from the pressure side of the impeller blades of said pump to the suction side of the impeller blades of said pump.

26. The process of claim 25 wherein the portion of said slurry which is recirculated from the pressure side to the suction side of said impeller blades is within the range of 0.5-50% of the total flow through said loop reactor.

27. The process of claim 25 wherein the portion of said slurry which is recirculated from the pressure side to the suction side of said impeller blades is within the range of 1-25% of the total flow through said loop reactor.

28. The process of claim 25 wherein said slurry is diverted by the provision of a plurality of holes in at least some of said impeller blades.

29. The process of claim 28 wherein the total surface of area of the holes in said impeller blades within the range of 0.1-35% of the total surface area of said blades.

30. The process of claim 28 wherein the total surface of area of the holes in said impeller blades within the range of 0.5-15% of the total surface area of said blades.

34. The process of claim 36, wherein the flow of said slurry through said loop reactor is diverted by providing a plurality of obstacles in the flow path of the slurry flowing through said loop reactor.

35. The process of claim 36, wherein the polymer product recovered from said loop reactor has a bulk density which is from 1-5% greater than the bulk density recovered from said reactor system when it is operated without the diversion of slurry through said loop reactor as recited in claim 16.

36. A method of forming polyolefins comprising:

supplying ethylene monomer in a carrier liquid to a reactor system comprising at least one loop reactor;

circulating the ethylene through the loop reactor in the presence of a catalyst system to form a slurry of polymer fluff particles in the carrier liquid;

altering the flow of at least a portion of the slurry by at least one of:

flowing a portion of the slurry through a bypass line extending from one location of the loop reactor to another location of the same loop reactor;

operating a circulating pump and circulating the slurry through the loop reactor at an efficiency of from 30-75% of a pump capacity; or

providing a plurality of obstacles in a flow path of the slurry within the loop reactor; and

while continuing the introduction of the carrier liquid and ethylene monomer into the loop reactor, withdrawing a portion of the slurry from the loop reactor as a polymer product.

38. A method of forming polyolefins comprising:

supplying ethylene monomer in a carrier liquid to a reactor system comprising at least one loop reactor;

circulating the ethylene through the loop reactor in the presence of a catalyst system to form a slurry of polymer fluff particles in the carrier liquid;

altering the flow of at least a portion of the slurry by flowing a portion of the slurry through a bypass line extending from one location of the loop reactor to another location of the loop reactor, wherein the flow circulates through the bypass line without the aid of a pump disposed within the bypass line; and

while continuing the introduction of the carrier liquid and ethylene monomer into the loop reactor, withdrawing a portion of the slurry from the loop reactor as a polymer product.

Appendix B

Evidence

Not Applicable

Appendix C

Related Proceedings

Not Applicable